

IN THE CLAIMS

1. (CURRENTLY AMENDED) Apparatus for heart pacing with hemodynamic improvement, comprising:

one or more electrodes, which are adapted to convey electrical signals to respective cardiac muscle segments; and

signal generation circuitry, which applies an extended pacing signal, having an overall duration greater than 8 ms, ~~three times a chronaxie time~~, to the one or more electrodes so as to pace the heart.

2 (ORIGINAL) Apparatus according to Claim 1, wherein the overall duration is at least 10 ms.

3. (ORIGINAL) Apparatus according to Claim 2, wherein the overall duration is at least 20 ms.

4. (ORIGINAL) Apparatus according to Claim 1, wherein the overall duration is less than approximately 100 ms.

5. (CURRENTLY AMENDED) Apparatus according to Claim 1, wherein the cardiac muscle segments to which the one or more electrodes are adapted to be applied are characterized by a refractory period, and wherein the overall duration of the signal is such that the signal terminates during the refractory period.

6. (ORIGINAL) Apparatus according to Claim 1, wherein the signal has a leading edge and a trailing edge, and wherein the trailing edge is characterized by an absolute rate of voltage change substantially smaller than that of the leading edge.

7. (ORIGINAL) Apparatus according to Claim 6, wherein the absolute rate of the voltage change is less than a minimum rate of change necessary to generate an action potential in the cardiac muscle segments.

8. (ORIGINAL) Apparatus according to Claim 1, wherein the signal has an amplitude at least three times as great as a threshold for pacing the heart, but not sufficient for cardioversion.

9. (ORIGINAL) Apparatus according to Claim 8, wherein the signal has a duration at least three times a threshold duration for pacing the heart at the amplitude of the signal.

10 (ORIGINAL) Apparatus according to Claim 1, wherein the extended pacing signal comprises a train of pulses.

11. (ORIGINAL) Apparatus according to Claim 10, wherein each of the pulses in the train has a pulse duration of at least 1 ms.

12 (ORIGINAL) Apparatus according to Claim 10, wherein the pulse train has a period of at least 5 ms.

13. (ORIGINAL) Apparatus according to Claim 12, wherein the pulse train has a period of at least 20 ms.

14. (ORIGINAL) Apparatus according to Claim 10 wherein the train of pulses comprises a plurality of biphasic pulses.

15. (ORIGINAL) Apparatus according to Claim 10, wherein the train of pulses has a duty cycle between about 10% and 50%.

Claims 16-48 (WITHDRAWN)

49. (CURRENTLY AMENDED): A method for heart pacing with enhancement of cardiac contraction, comprising:

applying one or more electrodes to a subject's heart; and

conveying an extended pacing signal, having an overall duration greater than 8 ms, ~~of at three times a chronaxie time~~, to the one or more electrodes so as to pace the heart.

50. (ORIGINAL) A method according to Claim 49, wherein the overall duration is at least 10 ms.

51. (ORIGINAL) A method according to Claim 50, wherein the overall duration is at least 20 ms.

52. (ORIGINAL) A method according to Claim 49, wherein the overall duration is less than approximately 100 ms.

53. (CURRENTLY AMENDED): A method according to Claim 49, wherein the cardiac muscle segments to which the one or more electrodes are adapted to be applied are characterized by a refractory period, and wherein the overall duration of the signal is such that the signal terminates during the refractory period.

54. (ORIGINAL) A method according to Claim 49, wherein the signal has a leading edge and a trailing edge, and wherein the trailing edge is characterized by an absolute rate of voltage change substantially smaller than that of the leading edge.

55. (ORIGINAL) A method according to Claim 54, wherein the absolute rate of the voltage change is less than a minimum rate of change necessary to generate an action potential in the cardiac muscle segments.

56. (ORIGINAL) A method according to Claim 49, wherein the signal has an amplitude at least three times as great as a threshold for pacing the heart, but not sufficient for cardioversion.

57. (ORIGINAL) A method according to Claim 56, wherein the signal has a duration at least three times a threshold duration for pacing the heart at the amplitude of the signal.

58. (ORIGINAL) A method according to Claim 49, wherein conveying the extended pacing signal comprises conveying a train of pulses.

59. (ORIGINAL) A method according to Claim 58, wherein each of the pulses in the train has a pulse duration of at least 1 ms.

60. (ORIGINAL) A method according to Claim 58, wherein the train of pulses has a period of at least 5 ms.

61. (CURRENTLY AMENDED): ~~Apparatus~~ A method according to Claim 60, wherein the train of pulses has a period of at least 20 ms.

62. (ORIGINAL) A method according to Claim 58, wherein conveying the train of pulses comprises conveying a plurality of biphasic pulses.

63 (ORIGINAL) A method according to Claim 58, wherein the train of pulses has a duty cycle between about 10% and 50%.

Claims 64-99 (WITHDRAWN)